





355 West North Temple 3 Triad Center, Suite 350 Salt Lake City, Utah 84180-1203 801-538-5340

TO:

Daron Haddock, Permit Supervisor

FROM:

Priscilla Burton, Inspector

DATE:

September 13, 1991

RE:

Well Inspection, Proposed Refuse Disposal Site, Soldier Creek Coal

Company, Soldier Canyon Mine, CEP/007/018, Folder #2, Carbon

County, Utah

SUMMARY

In the first quarter of 1991, SC3 installed four water monitoring wells in the proposed wasterock disposal site. Copies of the As Builts of the wells and sampling information were obtained. The wells were located on draft Plate 7-22-1. These sites were inspected.

TECHNICAL INFORMATION

On September 10, 1991 an inspection was made of the four wells installed in the vicinity of the proposed waste disposal site. The wells were installed in the first quarter of 1991 with Division approval and supervision by Dave Darby.

Attached are the As Built well designs. The wells were air drilled. The sites were clean. The cement groutings were sound. The wells are all steel capped and locked. The well casings are all 4" PVC pipe. The two higher elevation wells do not require any reseeding. The two wells by Anderson reservoir will be seeded this fall.

The location of the wells is shown in the draft Plate 7-22-1 which will be submitted with the permit renewal information on October 11, 1991, along with monitoring information. The first quarter sampling was performed by EarthFax at the time of drilling. Mr. John Pappas has monitored the wells in the second and third quarters of this year according to the ground water analysis parameters defined in the Mining and Reclamation Plan.

When Mr. Pappas samples the wells, he bails the well until a constant electrical conductivity reading is obtained. Then, he takes a sample. Samples are packed in ice and sent to ACZ Laboratory in Steamboat Springs, Colorado. Field notes for the second and third quarters are included with this report, page 2.

Page 2 Well Inspection CEP/007/018 September 13, 1991

Well Monitoring 1st and 2nd Quarters 1991

<u>DATE</u>	WELL ID	DEPTH TO H2O	<u>рН</u>	EC mmhos/ cm	Temp F
5/15	MW 1C	11.6'	7.32	11.35	62.2
8/23	MW 1C	14.0'	7.61	11.54	61.0
5/15	MW 1M	37.6'	9.29	11.30	63.8
8/23	MW 1M	21.4'	8.25	11.10	61.7
5/15	MW 2M	143.8'	7.77	9.23	65.2
8/23	MW 2M	142.4'	7.88	9.50	65.0
5/15	MW 3M	228.6'	7.37	19.56	63.8
8/23	MW 3M	217.3'	7.52	18.96	63.1

CONCLUSION

The installation of the wells has been conducted in an ecologically sound manner. Monitoring of the wells occurs quarterly. Information from well monitoring will be provided in the Mining and Reclamation Plan permit renewal to be received October 11, 1991. A Division hydrologist may be interested in sampling the wells with Mr. Pappas on a future inspection.

Attachments

cc: R. Summers

S. Falvey

SOLDWELL.MPB

Project None REUSE CISPOSAL AREA RELLS Chemer Citient SUDDER GREEK COAL CORPANY Project Number: C159-06 Reference Elevation 6, 066, 43 Reference Elevation
Reference Elevation: 6, 066.43 Reference Elevation: 2 Uniting Contractor: 2 Uniting Contractor: 2 Uniting Contractor: 2 Uniting Contractor: 2 Uniting Repair Interpretation of Contractor: 2 Un
Project Number: C159-06 Onte Drilled: 03/21/91 Logged By: BKB Prist accurrence of G.H. 10 31 Static H.L. 9.25 ft Boring Depth (Ft): 17.5 ft Hell Depth (Ft): 17.5 ft Boring Depth (Ft): 17.5 ft Hell Depth (Ft): 17.5 ft Boring Diameter (in): 7.88 in LITHOLOGIC DESCRIPTION AND OBSERVATIONS SILTY CLAY light ton, 20% clay, 70% silt, 10% coorse sand, dry SILTY CLAY light ton, 20% clay, 70% silt, 10% coorse sand, dry SILTY CLAY light ton to ton with minor assumts of grey camented siltstone frogments in Amount of silstone chips and depth of 17.5 feet. From 3 to 17.5 feet the zone is moist. TOTAL DEPTH - 17.5 ft Orilling Contractor: CRUMERIAN RELL SERVICE Drilling Hethod AIR-ROTARY Rig Type: INGERSDL-RAND Bering Depth (Ft): 17.5 ft Hell Depth (Ft): 17.5 ft Boring Diameter (in): 7.88 in UELL COMPLETION DETAILS CLAYER SILT light ton, 20% clay, 70% silt, 10% coorse sand, dry TOTAL DEPTH - 17.5 ft Threaded End Plug
Date Drilled: 03/21/91 Logged By: BKB First occurrence of G.H. 10 31 Static H.L. 9.25 Ft Ontes Measured: 03/22/91 03/28/91 Boring Depth (Ft): 17.5 Ft Boring Diameter (in): 7.88 in LITHOLOGIC DESCRIPTION AND OBSERVATIONS SILTY CLAY light tan, 20% clay, 3% silt, dry CLAYEY SILT light tan, 20% clay, 70% silt, 10% consessed, dry SILTY CLAY light tan to tan mith einer assounts of grey cenented siltstone Engagers. Assount of silstone chips of depth of 17.5 Fest From 9 to 17.5 Fest the zone is noist. TOTAL DEPTH = 17.5 Ft Threaded End Plug TOTAL DEPTH = 17.5 Ft
Logged By: BKB First accurrence of G.H. 10 31 Static H.L. 9 25 Ft Dates Measured: 03/22/91 03/28/91 Boring Depth (Ft): 17.5 Ft Dates Measured: 03/22/91 03/28/91 Boring Diameter (in): 7.88 in LITHOLOGIC DESCRIPTION AND OBSERVATIONS LITHOLOGIC DESCRIPTION AND OBSERVATIONS SILTY CLAY light ton, 95% cloy, 5% silt, dry Cement/Bentonite Grout For Surface Cosing Bentonite Send 70 Neeh Sond 7-7/8 Bore Hole 10% coerces and, dry SILTY CLAY Light ton to tan Hith airon amounts of grey comented siltstone frogeners. Amount of silstone chips progressively increases with depth to a high of 10% of a depth of 17 5 Feet. From 9 to 17 5 Feet the zone is moist TOTAL DEPTH * 17 5 Ft Threaded End Plug
First occurrence of G.H. 10 31 Static H.L. 9 25 ft Dates Measured: 03/22/91 03/28/91 Boring Depth (Ft): 17.5 ft Baring Diameter (in): 7.88 in LITHOLOGIC DESCRIPTION AND OBSERVATIONS SILTY CLAY Tight ton, 95% cloy, 5% silt, dry Clayer SILT light ton, 20% clay, 70% silt, 10% coarse and, dry SILTY CLAY Tight ton to tan with minor amounts of grey coentred siltstone frogments. Amount of silstone chips particularly depth of 17.5 feet. From 5 to 17.5 feet the zone is doi: TOTAL DEPTH - 17.5 ft Threaded End Plug Total Depth - 17.5 ft
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LITHOLOGIC DESCRIPTION AND OBSERVATIONS SILTY CLAY light ton, 95% cloy, 5% silt, dry Cement/Bentonite Grout 5" Surface Casing Bentonite Seal 70 Neeh Sand CLAYEY SILT light ton, 20% clay, 70% silt, 10% cooree end, dry SILTY CLAY light ton to tan with minor assumts of grey comented siltstane frogments. Amount of siltstone chips progressively increases with depth to a high of 10% at a depth of 17 5 feet. From 9 to 17 5 Feet the zone is moist TOTAL DEPTH = 17 5 Ft Threaded End Plug
LITHOLOGIC DESCRIPTION AND OBSERVATIONS SILTY CLAY light ton, 95% clay, 5% silt, dry Cement/Bentonite Grout 6" Surface Casing Bentonite Seal 70 Heeh Sand Thee Sand CLAYEY SILT light ton, 20% clay, 70% silt, 10% coarse sand, dry SILTY CLAY light ton to tan with annor arounds of grey cemented siltsine Progents. About of silstone chips progressely increases with depth to a high of 10% at a progressely increases with depth to a high of 10% at a noist TOTAL DEPTH * 17 5 Ft Threaded End Plug
CLAYEY SILT light tan, 20% clay, 70% silt, 10% coarse sand, dry. SILTY CLAY light tan to tan with minor amounts of grey cemented siltstone fragments. Amount of silstone chips pragressively increases with depth to a high of 10% at a depth of 17.5 feet. From 9 to 17.5 feet the zone is moist 10TAL DEPTH = 17.5 ft

EARTHFA	X ENGINEERING, INC. DRILL	ING LOG			PAGE 1 OF 1
1 -	Name: REFUSE DISPOSAL AREA WELLS lient: SOLDIER CREEK CDAL COMPANY	Boring/Well			2 771 13 F 483 265 64 N
	Boring/Hell Location: 2, 242, 771.13 E 483, 265.64 N Reference Elevation: 6, 066.38				
Project	Reference Point: GROUND SURFACE				
	illed: 03/19/91	1 -			MAN WELL SERVICE
	By: TJS/BKB courrence of G W NA Static W.L.: NA	Orilling Met Boring Depth			Rig Type: INGERSOL-RAND Well Depth (Ft): 69.01
	easured: NA 03/28/91	Boring Diame			
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DEPTH (FT)	LITHOLOGIC DESCRIPTION		SAMPLE		WELL COMPLETION
1 1	AND OBSERVATIONS		SAM		DETAILS
0	SILTY CLAY: light grey, 90% clay, 10% silt, dry.				
	CLAYEY SILT: light tan, 30% clay, 70% eilt, eame coarse sand, dry				
388					6" Surface Casing
	SHALE: Heathered Mancoo Shale, grey, ohale chips in cuttings, ooft and frioble.				
10 —					
-					Cement/Bentonite Grout
	transition zone from weathered to competent Mancos Shale (16.5 to 191)				
20 —	000				
	SHALE Mancos Shale, grey, hard, 90% clay, 5% silt, 5% very fine sandstone, trace of moisture between 18 and 20 feet.				
	. 90% clay, 10% silt - Water encountered				
-0.000	from the colluvial and weathered Mancos layers. Interior of chips from competent Mancos ore dry				Bentonite Seal
-5555 -6555	90% clay, 5% silt, 5% very fine sandstone.				
30 —	Interior of chips still dry Making approximately 10 gpm from hale				
1000					
-888	90% clay, 10% silt, interior of chips dry. Stopped drilling and set surface casing to seal				
	off water. Set drive casing to 45 feet.				PVC Cosing
40	95% clay, 5% silt, dry hole.				
-0505					
	same as above				
					70 Mesh Sand
50 —	E come as above				10-20 Mesh Filter Pack
-	ind				7-7/8" Bore Hale
- 355	ES Some as above.				1-176 Bulle hore
					4" PVC 10-Slot Screen
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	ene as above				
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ARTHFAX	ENGINEERING, INC. DRILLI	ING LOG		PAGE 1 OF 2	
	ome: REFUSE DISPOSAL AREA WELLS	Boring/Well			
Owner/Client: SOLDIER CREEK COAL COMPANY		Boning/Hell Location: 2, 244, 371.92 E 484, 086.92 N			
Project N	umber: C159-06	Reference Po			
Oote Ocil	led: 03/26/91			ZIMMERMAN WELL SERVICE	
Logged By		Drilling Met			
	unnence of G.W. NA Static W.L. NA			44.0 ft Well Depth (ft): 144.0 ft	
Dates Mea	sured: NA 03/28/91	Boring Diame	eter (in):	12.25"/7.88"	
				*	
_ 8			361		
DEPTH (FT)	LITHOLOGIC DESCRIPTION		SAMPLE	WELL COMPLETION	
	AND OBSERVATIONS		SA	DETAILS	
°	SILTY CLAY: medium brown, 90% clay, 10% silt, dry.			Cement/Bentonite Grout	
	CLAYEY SILT: brown to orange, 40% clay, 60% silt,		·		
	some shole closts, dry. SANDY SILT: medium brown to orange, 70% silt, 20% very fine sand, 10% clay, dry.			6" Surface Casing	
	SANDSTONE: buff to pinkish buff, very fine grained				
10 📥	sandstone, hard, some minor closts of Heathered shale.				
3					
-	00.05% -1.5 5.10%				
	SHALE: Mancas Shale, alive green, 90-95% clay, 5-10% sit friable, dry:	ιτ,			
<u>"</u>					
20 —	light grey, friable, minor amounts				
-	of gypšum present.				
	90% clay, 10% sult, poorly cemented, maist.				
30					
	. 80% clay, 20% silt, poonly consolidated,				
	molat.			4" PVC Casing	
	95% clay, 5% silt, Hell consolidated, dry.				
	same as above.				
20 —	same as above.				
	same as above.			7-7/8" Bore Hote	
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EARTHFAX ENGINEERING, INC. DRIL	LING LUG PAGE 2 OF 2			
Project Name: REFUSE DISPOSAL AREA WELLS	Boring/Well Number: MW-2M			
Dwner/Client: SOLDIER CREEK COAL COMPANY	Boring/Well Location: 2,244,371.92 E 484,086.92 N			
Project Number: C159-06	Reference Elevation: 6, 139.63			
	Reference Point: GROUND SURFACE			
Date Drilled: D3/26/91	Drilling Contractor: ZIMMERMAN WELL SERVICE			
Logged By: BKB First occurrence of G W NA Static W.L. NA	Orilling Method: AIR-ROTARY Rig Type: INGERSOL-RAND			
Dates Measured NA 03/28/91	Boring Depth (Ft): 144.0 ft Well Depth (Ft): 144.0 ft Boring Diameter (in): 12.25"/7.88"			
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E E LITHOLOGIC DESCRIPTION	S WELL COMPLETION			
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SHALE				
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110 some os above	Bentonite Seal			
same as above	7-7/8" Bore Hole			
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ARTHFAX	ENGINEERING, INC. DRILL	ING LOG		PAGE 1 OF 3
•	Name: REFUSE DISPOSAL AREA WELLS	Boring/Well		
Owner/Cli	Boring/Well Location: 2, 242, 502.68 E 485, 090.63 N			
Project M	Reference Elevation: 6,230.13 Reference Point: GROUND SURFACE			
Date Dril	led: 03/27/91			ZIMMERMAN WELL SERVICE
.ogged By	·: BKB	Drilling Met		
	currence of G.W.: NA Static W.L. NA	Boring Depth		•
Dates Med	psured: NA 03/30/91	Boring Diame	ter (in	n): 12.25"/7.88"
و				,
74 LOG	LITHOLOGIC DESCRIPTION		201	WELL COMPLETION
GRAPHICAL			SAMPLE	
• 5	AND OBSERVATIONS		ु ।	DETAILS
	SILTY CLAY: light grey, 60% clay, 30% silt, 10% sand, SANDSTONE: buff to light tan, cemented, dry.	ary		
3	tan to light brown, hord, dry.			6" Surface Casing
# 1			Ť	
	. white, very hand, dry.		ति अस्ति साम्पास्य स्थापना स्थ	6" Sunface Casing Cement/Bentonite Grout
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4.53	tan, very hard, dry			
3	tally lidits, dry			
# 1				
۰	SHALE Weathered Moncos Shale, tan to light grey, 70% 30% silt, soft and friable, Heathered, dry.	clay,		
	ton to light grey, 80% clay, 20% selt, friable, trace of gypsum, dry.			Bentonite Seal
· —	light to dark grey, 95% clay, 5% silt, dry			
	SHALE: Mancos Shole, light to dank grey, 95% clay, 5%	silt.		
	hard, dry.	,		4" PVC Casing
	SANDSTONE: tan, 95% sandstone, 5% silt, hard, dry. SHALE: Mancos Shale, light to dark grey, 95% clay, 5%	211		
	hand, dry.	3110,		
	. same as above.			
	same as above, with a trace of gypsum.			
	same as above.			7-7/8" Bore Hole
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	some as above, with a trace of gypsum.			
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EARTHFAX ENGINEERING, INC. DRILL	ING LOG PAGE 2 OF 3
Project Nome: REFUSE DISPOSAL AREA WELLS	Boring/Well Number: MW-3M
Owner/Client: SOLDIER CREEK COAL COMPANY	Boring/Hell Location: 2, 242, 502.68 E 485, 090.63 N
Project Number: C159-06	Reference Elevation: 6, 230.13
	Reference Point: GROUND SURFACE
Date Onilled: 03/27/91	Drilling Contractor: ZIMMERMAN HELL SERVICE
Logged By: BKB	Drilling Method: AIR-ROTARY Rig Type: INGERSOL-RAND
First occurrence of G.W. NA. Static W.L. NA	Boring Depth (Ft): 236.0 ft Well Depth (Ft): 236.0 ft
Oates Measured: NA 03/30/91	Boring Diometer (in): 12.25"/7.88"
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LITHOLOGIC DESCRIPTION AND OBSERVATIONS	WELL COMPLETION DETAILS
1 = 1 = 1	₹ DETAILS
SHALE Mancos Shale, light to dark grey, 95% clay, 5% :	oilt,
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struction of the same of the s	7-7/8" Bore Hole
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EART	HFAX	ENGINEERING, INC. DRILL	ING LOG		PAGE 3 OF 3
Proj	ect N	Name: REFUSE DISPOSAL AREA WELLS	Boring/Well	Numbe	er: MW-3M
1		ent: SOLDIER CREEK COAL COMPANY	· -		tion: 2, 242, 502.68 E 485, 090.63 N
		Reference Elevation: 5, 230.13			
Project Number: C159-06			5		GROUND SURFACE
Date	Ori	led: 03/27/91			ton: ZIMMERMAN WELL SERVICE
Logg	Logged By: BKB			thod:	AIR-ROTARY Rig Type: INGERSOL-RAND
Firs	st occ	currence of G.W. NA. Static W.L. NA	Boring Depth	h (ft): 236.0 ft Hell Depth (ft): 236.0 ft
Date	s Med	isured: NA 03/30/91	Boring Diame	eter	(in): 12.25"/7.88"
1_	81			83	
=	ICAL	LITHOLOGIC DESCRIPTION			WELL COMPLETION
OEP1H (FT)	GRAPHICAL LOG	AND OBSERVATIONS		SAMPLE	DETAILS
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		ec empe .			10-20 Mesh Filter Pock
		and a chair			
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1 7					9" PVC 10-Slot Screen
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230		same as above.			
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